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Date of Birth: 5 March, 1994

Karan Anand

Curriculum Vitae

Introduction

I am a dedicated and results-driven mechanical engineer specialising in Fluid Dynamics and Multiphase flows with over 5 years of experience in reasearch and development of numerical simulations. I am passionate about creating innovative solutions to complex problems and thrive in collaborative environments. My expertise lies in Computational Fluid Dynamics (CFD) and High Performance Computing (HPC).

Experience

February, 2024–Present **Postdoctoral Researcher**, *Laboratoire de Genie Chimique*, Toulouse, France, Full-time

- Developing particle-wall boundary conditions for Euler-Euler simulations of Fluidized Bed Reactors using a multiscale approach and CFD-DEM simulations.
- This work is part of the ANR project PEPR OXY3C to decarbonize biomass combustion through Chemical Looping Combustion technology.
- Euler-Euler and LES-DEM simulated using the massively parallel codes *neptune_cfd* and *yales2*, respectively.

October, 2020 – December, 2023 **Doctoral Research Fellow**, *Institut de Mécanique des Fluides de Toulouse*, Toulouse, France, Full-time

- Developed discrete particle simulations coupled with RANS to analyze the impact of ellipsoidal particle collisions in gas-solid flows.
- Worked on modelling of collision contribution in bidispersed particle flows.
- Doctoral research grant funded by CNRS.

March, 2019 – September, 2020 **Research Intern**, *Institut de Mécanique des Fluides de Toulouse*, Toulouse, France, Full-time

- Gained key insights into the lift and drag characteristics of hydrofoils with super-hydrophobic coatings using Direct Numerical Simulations (DNS) and slip boundary conditions to model hydrophobicity.
- Summer research grant funded by Campus France.

Education

2020–2024 **PhD in Fluid Mechanics**, *Université de Toulouse*, Toulouse, France

2019–2020 **Master of Science in Fluids Engineering & Industrial Processes**, *Institut National des Sciences Appliquées de Toulouse*, Toulouse, France

2017–2019 **Master of Technology in Computational Fluid Dynamics**, *University of Petroleum and Energy Studies*, Dehradun, India

2012–2016 **Bachelor of Technology in Mechanical Engineering**, *College of Engineering*, Bhubaneswar, India

Competences

Programming	Fortran, Python, C/C++
Simulation Codes	*neptune_cfd*, *yales2*, Ansys Fluent, COMSOL, StarCCM
Tools & Technologies	Linux, Git, Matlab, Machhine Learning, CATIA
High-Performance Computing (HPC)	MPI/OpenMP, Cuda
Languages	English, French, Hindi

Articles

Soot deposition effects and microwave regeneration modelling of diesel particulate filtration system, C. Kurien, A.K. Srivastava, N. Gandigudi, K. Anand, *Journal of the Energy Institute*, 93(2), 463-473.

Modelling of Microwave-Based Regeneration in Composite Regeneration Emission Control System, Caneon Kurien, Ajay Kumar Srivastava, Karan Anand, Niranajan Gandigudi, *Intelligent Communication, Control and Devices: Proceedings of ICICCD 2018*.

Conferences

April 2023 **11th International Conference of Multiphase Flows, Kobe, Japan**: *Numerical simulation of inertial ellipsoidal particles in a vertical gas-solid channel flow with inter-particle and particle-wall collisions.*

September 2022 **IUTAM Symposium: From Stokesian Suspension Dynamics to Particulate Flows in Turbulence, Toulouse, France**: *Numerical Simulation and modelling of bi-dispersed mixture of particles in a channel flow.*

May 2022 **6th International Conference on Turbulence & Interactions, Elba Islands, Italy**: *On the interactions of binary mixtures of particles in a vertical channel flow.*

References

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